

Pediculosis (Head Lice) - Management

Background

Head lice are small insects that can live in human hair. The six-legged, wingless adult head louse is about the size of a grain of salt and ranges in color from tan to gray. They can multiply rapidly, laying seven to 10 eggs per day. These small silvery-white to brown-colored oval-shaped eggs (called nits) resemble dandruff. However, they are attached to the base of the hair, close to the scalp, with a glue-like substance that makes them difficult to remove.

It's hard to see adult head lice because they are very small, they avoid light, and they're able to move fast. It is easier to see the nits. They are most often found in the hair behind the ears and at the back of the head and neck. Nits should not be confused with dandruff: dandruff can easily be flicked off the hair while nits are firmly attached to individual hairs.



Lice aren't dangerous and they don't spread disease, but they are a nuisance. One sign of head lice is a persistent itching of the scalp. The bites may cause a child's scalp to become inflamed, and persistent scratching may lead to skin infection. However, some children don't experience any itching from head lice.

Note that head lice live only on the human scalp – they do not infest household pets. Therefore, **pets do not need to be treated for head lice.**

Head lice cannot fly or jump; they crawl. They are spread through direct contact with an infested person, including sexual contact, or with shared items such as combs, brushes, towels, pillowcases, hats, scarves, stuffed animals, headphones, other headgear, and clothing. Shared lockers and wall hooks may enable lice to spread on personal items. Spread of lice is especially easy in group settings (e.g., schools, child-care centers, slumber parties, sports activities, camps, and even playgrounds). They may be spread as long as lice or eggs remain alive on the infested person or in clothing.

The life span of the female louse is about one month. However, head lice need human blood to survive. They usually do not survive for more than two days away from the human body. Nits cannot hatch at the lower temperatures found away from the scalp.

Treatment

Head lice are a nuisance, but they may be effectively treated.

First, ensure that a correct diagnosis/identification has been made. Treatment should be given only to people who have active lice or viable eggs present: itching of the scalp or the feeling that something is crawling on the head does not warrant treatment for lice. However, some experts believe prophylactic treatment is reasonable for persons who share the same bed with actively-infested individuals. To reduce the risk of re-infestation, infested persons and their contacts should all be treated at the same time.

There are four critical steps to controlling an infestation of head lice:

- the use of an effective head louse treatment;
- nit removal from the head (combing);
- removal of lice and nits from the household environment by vacuuming, storing, washing, or freezing objects suspected being infested; and,
- daily head checks and nit removal until infestation is gone, followed by weekly head checks to detect re-infestation.

Medication

Your doctor can recommend a medicated shampoo, cream, or lotion to kill head lice. These may be over-the-counter or prescription medications, depending on what treatments have already been tried. Although generally effective, treatments may be unsuccessful because of incorrect use or because the lice may be resistant to the chemical – however, even with successful treatment it may take a few days for the itching to stop.

For persons over two years of age, the currently recommended treatment is a medicated product (note, however, that pregnant women should **not** use these products). Many medicated shampoos are available over-the-counter without a prescription. Over-the-counter medicated shampoos generally contain either pyrethrin (e.g., RID, A-200, Pronto, R&C, Triple X) or permethrin (e.g., Nix Lotion). Pyrethrin products kill only lice – they do not kill nits. Therefore, retreatment seven to 10 days later is necessary to kill newly matured lice. Permethrin kills both nits and newly hatched lice for several days after treatment. However, a repeated treatment is also recommended seven to 10 days later for best results. Current recommendations favor permethrin products as a first-line treatment. Do **not** use more than one head lice medication at a time.

Note that, you should **not** use over-the-counter medicated lice treatments for children less than two years old. Instead, remove the nits and lice only by using a fine-tooth comb on the child's hair after regular shampooing every day for two weeks (see details below). If necessary, Elimite cream (permethrin 5%) is available by prescription for use in children over two months of age – consult with your pediatrician.

Detailed Treatment Steps

In general, follow these treatment steps (skip step 2 if no lice treatment medication will be used):

1. It may be helpful to remove clothing that can become wet or stained during treatment.
2. If lice treatment medication is to be used, apply the product according to the instructions contained in the box or printed on the label. If the infested person has very long hair (longer than shoulder length), it may be necessary to use a second bottle. Pay special attention to instructions on the label or in the box regarding how long the medication should be left on the hair (usually for 10 minutes) and how it should be washed off. Do not apply to eyes, face, or mucous membranes - minimize body exposure by confining the medication to the head hair. Do not use it in the bath or shower – instead, wash the

infested person's hair in a basin or sink so the medication does not reach other parts of the body. The person doing the treatment should wear rubber gloves.

WARNING: Do not use a creme rinse, combination shampoo/conditioner, or conditioner before using lice removal preparations.

Rinse the hair as directed by the product package. Do not re-wash the hair for 1-2 days after the product is used.

3. Water, vegetable oils, hair conditioners, or vinegar may help lubricate the hair and ease the combing process, but this may make it more difficult to see the eggs.

Rinsing with vinegar may help to loosen nits. Grasp a lock of hair with a cloth saturated with vinegar and strip the lock downward to remove nits. Repeat until you've treated all the hair in this way. Or soak hair with vinegar and leave it on for a few minutes before combing.

4. Comb the hair using a regular comb to remove snarls.
5. Remaining eggs should be removed from the hair shafts with a special nit comb or fine-tooth comb often found in the product package (metal combs are much more effective than plastic). Many flea combs made for cats and dogs are also effective. Checking the hair a small section at a time under a bright light or lamp that can be directed at the area being worked on and using a magnifying glass makes the nits easier to find. Tissues to clean the comb, a plastic bag for the discarded tissues, and hair clips to pin up the sections of hair that have been combed are also helpful. This may take an hour or more, so an entertaining video may help keep the child occupied.

Starting at the crown of the head, separate out a section of hair that is about 1 inch by 1/2 inch; hold it out from the head. Insert the louse comb at the base of the hair section as close as possible to the scalp, and pull the comb slowly through the hair. Be sure to slant the comb so that the curved side of the teeth is towards the head. While straight hair is usually easy to comb, tight curls may be difficult. Use the tissues to clean the louse comb frequently to remove any caught lice or debris, and put the tissue in the plastic bag. Continue to comb the section of hair until you feel sure it is free of nits or lice, then pin it out of the way with a hair clip and start on the next section of hair. If the hair dries during the combing process, wet it again with water to reduce pulling and hair loss. Another option is to go through each small section of hair and use your fingernails to pull the eggs off the hair or cut the individual hairs off. When all the hair has been combed, rinse it thoroughly with water.

To clean up, an old toothbrush or dental floss is useful in removing the debris that is lodged in the teeth of the comb. The plastic bag should be sealed and disposed of. Disinfect combs and brushes that have been used by soaking them in very hot water (130°F) for 5-10 minutes, or in lice shampoo for four minutes, or in a 2% Lysol solution or rubbing alcohol for one hour.

6. Towel-dry the hair. Towels used to dry the hair should be washed immediately.
7. Have the person put on clean clothing.

8. After the hair is completely dry, check the entire head for lice and for stray nits and remove them individually.
 - If a few live lice are still found 8-12 hours after treatment, but are moving more slowly than before, it is because the medicine may take some time to kill all of the lice. Comb dead and any remaining live lice out of the hair using a fine-toothed nit comb.
 - If, after 8-12 hours of treatment, no dead lice are found and lice seem as active as before, the medicine may not be working. Speak with your healthcare provider; a different medicine may be necessary. If your healthcare provider recommends a different product, carefully follow the treatment instructions contained in the box or printed on the label.
9. Every 2-3 days, comb the hair with a nit comb to remove nits and lice to decrease the chance of self-reinfestation. This should continue for 2-3 weeks to be sure that all lice and nits are gone.

Note: Nits found close to the scalp after treatment should be removed. Nits that have died, as well as empty egg casings, play no role in the spread of head lice. As the hair grows (from the base), these attached eggs are transported away from the scalp. Therefore, eggs more than one-half of an inch away from the scalp are nearly always hatched and do not, by themselves, indicate an active infestation.

10. If lice treatment medication has been used, retreatment is generally recommended for most prescription and non-prescription (over-the-counter) drugs after 9-10 days in order to kill any surviving hatched lice before they produce new eggs (note: for the prescription drug malathion, retreatment is recommended after 7-9 days ONLY if crawling bugs are found).

Note: UV lights (aka “black lights”) may be helpful because the light fluoresces the nits – they appear as bright white specks. But, UV light may also fluoresce lint, hair debris, and dry skin - if you are unsure whether you are seeing a nit, use a natural light and a magnifying glass to take a closer look.

Other Treatment Considerations

The organochlorine insecticide lindane, and the organophosphate insecticide malathion are two of the active agents available by prescription for treating lice. These may be considered if live lice persist after two treatments with pyrethroid-based medicine, but should be used only with caution, carefully following the label.

"Home recipes" and commercial preparations based on mixtures of essential oils, salts, or other "natural" substances lack data to support efficacy. Substances that are not registered for use on the skin by government regulatory agencies (such as EPA or FDA) should not be used. Similarly, the use of enzyme treatments (to dissolve eggs), antibiotics, or antiparasitics (e.g., ivermectin) lack evidence of effectiveness.

Short hair is more readily searched for lice and eggs, and easier to comb for lice, but does not make the child invulnerable to infestation. Therefore, hair cutting is not generally necessary, but cutting the hair short may be considered in difficult cases.

Washing the hair each day may dislodge a few active lice, but the remaining lice and eggs will be unaffected. Although hair bleaches and dyes are meant for use on the scalp, they can be caustic, and their effectiveness in treating lice is unproven. Dandruff shampoos are also not particularly effective in removing lice.

"Electronic" louse combs that resemble small bug "zappers", or those with oscillating teeth, seem to offer little advantage, if any, over a traditional louse comb. Teeth of these devices may not effectively reach to the scalp and may not kill or remove eggs.

Suffocation of head lice with olive oil, mayonnaise, butter, margarine, or any similar food-grade product would seem to be safe, but may have associated hazards (e.g., accidents (slips), difficulty removing from the hair and scalp), would likely require prolonged application (hours), and has unknown efficacy. In addition, it would have no effect on nits, and so would need to be repeated. Do **not** use motor or machine oils, or kerosene, as these materials can be harmful. Pet shampoo should **not** be used to treat a lice infestation.

Hot dry air produced by standard hand-held hair dryers may kill lice and their eggs on a person's hair – however, heated air from these devices can scald the hair and the scalp, and the necessary treatment time/temperature/distance from a hair dryer are not known. Heated curling irons, hair straighteners, or similar devices may kill some lice and eggs, but may not safely be applied to hair nearest the skin where viable eggs are located. Most importantly, do **not** use a hair dryer or similar device on your child's hair after applying scalp treatments because some contain flammable ingredients.

Bacterial skin infections resulting from scratching may need treatment with a topical or an oral antibiotic – consult with a healthcare professional as needed.

Before using any medication, consult your doctor, pharmacist, or school nurse.

Treatment Failure

Treatment may appear to have been unsuccessful due to:

- Re-infestation from another infested person or from contaminated clothes, hats, etc.;
- Lack of adherence with therapy (e.g., inadequate combing to remove nits); or,
- Misdiagnosis of inactive infection. It is important to look for active lice not just nits.

However, resistance of lice to medication does occur. Still, while permethrin-resistant head lice exist in the United States, it does not mean that all (or even most) head lice are resistant to permethrin and related compounds. Permethrin and pyrethrins remain the treatment of choice for newly-identified infestations. If live lice persist following such treatments, then one may

consider that these lice could be resistant. Therefore, do **not** use the same medication more than twice on one person.

If a particular non-prescription treatment doesn't seem to be working, consult with your healthcare professional on other options. Ovide lotion (malathion 0.5%) kills live lice and kills some lice eggs, but a second treatment is recommended if live lice are still present 7-9 days after treatment. Malathion is only for use in children over six years of age and adults.

Kwell shampoo or cream (lindane 1%) is generally considered a "last ditch" medication due to the possibility of neurotoxicity enhanced by absorption through open sores or excessive application. Guidelines recommend that patients weigh at least 110 pounds to use this treatment.

The drugs used to treat lice are insecticides and can be dangerous if they are misused or overused. Do **not** use extra amounts of any lice medication unless instructed to do so by your physician and pharmacist. In addition, prescription-strength pyrethroid (3 - 5%) preparation normally meant for treating scabies infestations are unlikely to be more effective if non-prescription strength pyrethroids or pyrethrin medications are not effective.

In all cases, manual removal of nits is the most important procedure to follow.

Prevention

To prevent re-infestation, the hair of everyone in the household should be checked when anyone is found to have head lice. Everyone with head lice, as well as any persons who share the same bed with actively-infested individuals, should be treated on the same day.

Hair inspection and manual removal of the nits is very important in preventing re-infestation.

Soak hair-care items like barrettes, hair ties or bands, and headbands in rubbing alcohol or medicated shampoo for one hour. You can also wash them in hot water or just throw them away.

Clothing, bed linens, towels, and soft toys should be machine-washed in hot water (130°F) then put in the hot cycle of the dryer for at least 20 minutes. Items that are not machine-washable should be dry cleaned or sealed in a plastic bag for two weeks (enough time for any eggs to hatch and the lice to die). Objects may also be placed in a freezer (or outdoors if sufficiently cold) – this may require several days to be effective, depending on the temperature and humidity - for a freezer at 5°F or lower, all lice and eggs should be dead within 10 hours.

Floors, furniture, car seats and upholstery, and carpeting should be vacuumed to remove an infested person's hairs that might have viable nits attached. However, using insecticide sprays is **not** recommended. Head lice don't survive long once they fall off a person, so it's unnecessary to spend a great deal of time and money trying to rid the general environment of lice.

Children need to be told not to share coats, combs, brushes, hats, scarves, bandanas, ribbons, barrettes, hair ties or bands, towels, helmets, or other personal articles at school. Parents should routinely check their children's hair.

Childcare providers and schools need to have policies in place regarding head lice management and make sure that the parents are aware of them. However, the discovery of lice or their eggs on the hair should not cause the child to be sent home or isolated. In particular, treatment is not indicated if an infestation is not active. Therefore, children should be able to return to their usual activities and school or daycare after the first treatment – “no-nits” policies that require a child to be free of nits before they can return to school or a childcare facility are not recommended (note, however, that school-divisions and childcare centers in Virginia develop their own policy, and some currently do have “no-nits” policies). Current evidence does not support the efficacy and cost-effectiveness of classroom or school-wide screening for decreasing the incidence of head lice among school children. Some schools or childcare facilities send letters to parents of school-mates of infested children, although the need for this measure is unclear. If letters are sent, they should **not** identify the infested child/children.

Any lice or nits that might detach in a swimming pool would likely be removed by the pool filter or should otherwise die before attaching to a person. Closing a swimming pool because of a fear of lice is not necessary.

**Use of trade names is for identification purposes only and does not imply endorsement by the Virginia Department of Health.*